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(19) **United States**(12) **Patent Application Publication****Zagon et al.**(10) **Pub. No.: US 2021/0046147 A1**(43) **Pub. Date: Feb. 18, 2021**(54) **COMBINATORIAL THERAPIES FOR THE TREATMENT OF NEOPLASIAS USING THE OPIOID GROWTH FACTOR RECEPTOR**(71) Applicant: **THE PENN STATE RESEARCH FOUNDATION**, University Park, PA (US)(72) Inventors: **Ian S. Zagon**, Hummelston, PA (US); **Patricia J. McLaughlin**, Harrisburg, PA (US); **Jill P. Smith**, Washington, DC (US)(21) Appl. No.: **16/867,336**(22) Filed: **May 5, 2020****Related U.S. Application Data**

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(57)

ABSTRACT

The present invention relates to pharmaceutical compositions for treating neoplasias in an animal or human comprised of a carrier and therapeutically effective amounts of at least one chemotherapeutic agent along with the biotherapeutic endogenous pentapeptide Met-enkephalin, referred to as opioid growth factor. Also provided are methods of treating neoplasias in an animal or human in need of such treatment, comprising the administration to the animal or human therapeutically effective amounts of a pharmaceutical composition comprised of a carrier and therapeutically effective amounts of at least one neoplasia-treating agent, such as a chemotherapeutic agent or radiation, along with opioid growth factor.